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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER
VIEAUX, GARY

ART UNIT	PAPER NUMBER
2612	

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
	10/053,110	KRYMSKI, ALEXANDER I.
Office Action Summary	Examiner	Art Unit	
	Gary C. Vieaux	2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>26 October 2001</u>.

2a) ☐ This action is **FINAL.**   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-15</u> is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1-5, 8-12, and 15</u> is/are rejected.

7) ☒ Claim(s) <u>6,7,13 and 14</u> is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☒ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on <u>26 October 2001</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a)☐ All   b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)	4) ☐ Interview Summary (PTO-413)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____ .
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)	5) ☐ Notice of Informal Patent Application (PTO-152)
Paper No(s)/Mail Date _____ .	6) ☐ Other: _____ .

DETAILED ACTION

Claim Objections

5   **Claims 6, 7, 11, 12 and 15** are objected to because of the following informalities:

Regarding claim 6, the claim recites the limitation "the freeze-frame pixel" on line

2. There is insufficient antecedent basis for this limitation in the claim.

Regarding claim 7, the claim is objected to based on its dependence on objected

claim 6, as addressed above. The examiner notes that proper correction of claim 6 will

10   cure the objection to claim 7, without need for direct alteration of the instant claim.

Regarding claim 11, the claim implies that a third switch, used to reset the

photodetector and photodetector memory, is different than a first switch. The operation

of this third switch of claim 11 is inconsistent with the specification and claim 8 from

which claim 11 depends. The Examiner directs the applicant to the last line of page 4

15   through line 2 of page 5, which states "The photodetector PD with capacitance C1 is

connected to a reset voltage V_{rst} through the switch S1", and line 13 of page 6 in which

the photodetector is reset via switch S1. However, switch S1 is found to correspond

with the first switch of claim 8, which allows collection of a first image signal by the

photodetector, and which is supported by the specification on page 5 lines 12-13, which

20   states "To start an exposure 215, the photodetector is reset through S1." A third switch,

which allows for the photodetector and photodetector memory to be reset, is not found

to be clearly detailed in the specification. The Examiner suggests renaming the "third"

switch of claim 11, to be the "first" switch, in order to conform to claim 8 and the

specification as written. This claim will also be interpreted as such for claim rejections

based on the merits.

Regarding claim 12, the claim is objected to based on its dependence on

objected claim 11, as addressed above.   The examiner notes that proper correction of

5   claim 11 will cure the objection to claim 12, without need for direct alteration of the

instant claim.

Regarding claim 15, the claim as currently written recites inconsistent

terminology relating to a pixel "comprising an array of freeze frame-pixels." For the

purposes of examination, the Examiner will interpret the claim to regard the pixel to be

10   part of or included within an array of similar pixels.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

15   form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

20

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

25   (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

30   only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

   Claims 1, 2, 3 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by

Komiya et al. (US #5,264,940.)

   <u>Regarding claim 1</u>, Komiya teaches a method of dynamic range control

comprising collecting a short image signal during a first time period (fig. 21 indicator t1,

5   col. 14 lines 64-67), sampling the short image signal after the first time period (fig. 21

indicator READ, col. 14 lines 66-67), collecting a long image signal during a second

time period (fig. 21 indicator t2, col. 14 line 67 – col. 15 line 1), sampling the long image

signal after the second time period (fig. 21 indicator READ, col. 14 line 67 – col. 15 line

1), and combining the short image signal and the long image signal to create a total

10   image signal (fig. 20 indicator 56, col. 15 lines 1-2.)

   <u>Regarding claim 2</u>, Komiya teaches all the limitations of claim 2 (see the 102(b)

rejection to claim 1 <u>supra</u>), including wherein the second time period includes the first

time period (fig. 21, col. 14 line 63 – col. 15 line 4.)

   <u>Regarding claim 3</u>, Komiya teaches all the limitations of claim 3 (see the 102(b)

15   rejection to claim 1 <u>supra</u>), including where the method further comprises resetting a

photodetector prior to collecting the short image signal (fig. 21 indicator RST, at time 0,

col. 14 lines 63-66.)

   <u>Regarding claim 5</u>, Komiya teaches all the limitations of claim 5 (see the 102(b)

rejection to claim 1 <u>supra</u>), including where the method further comprises simultaneous

20   sampling of the short image signal while collecting the long image signal (fig. 21, col. 14

line 63 – col. 15 line 4.)

Claims 1-3, 5, 8-11 and 15 are also rejected under 35 U.S.C. 102(b) as being

anticipated by Dierickx et al. (EP 0858212 A1.)

Regarding claim 1, Dierickx teaches a method of dynamic range control

comprising collecting a short image signal during a first time period (fig. 5, refer to signal

5   line; col. 3 lines 4-8 and 29-32), sampling the short image signal after the first time

period (fig. 5, refer to sample line), collecting a long image signal during a second time

period (fig. 5 refer to signal line; col. 3 lines 8-9 and 33-35), sampling the long image

signal after the second time period (fig. 5, refer to sample line), and combining the short

image signal and the long image signal to create a total image signal (col. 3 lines 10-11,

10   23-24 and 35-37.)

Regarding claim 2, Dierickx teaches all the limitations of claim 2 (see the 102(b)

rejection to claim 1 supra), including wherein the second time period includes the first

time period (fig. 5, refer to signal line.)

Regarding claim 3, Dierickx teaches all the limitations of claim 3 (see the 102(b)

15   rejection to claim 1 supra), including where the method further comprises resetting a

photodetector prior to collecting the short image signal (fig. 5, refer to first pulse on reset

line.)

Regarding claim 5, Dierickx teaches all the limitations of claim 5 (see the 102(b)

rejection to claim 1 supra), including where the method further comprises simultaneous

20   sampling of the short image signal while collecting the long image signal (fig. 5, refer to

sample and signal lines.)

Regarding claim 8, Dierickx teaches a photodetector (fig. 5 indicator 3; fig. 2a indicator 23) having a memory (col. 3 lines 14-16), an analog memory (fig. 5 indicator 4; fig. 2a indicator C) and a plurality of switches which connect the photodetector to the analog memory, wherein a first switch allows collection of a first image signal by the

5   photodetector (fig. 5 indicator 2; fig. 2a indicator 22), a second switch allows transfer of the first image signal from the photodetector memory to the analog memory (fig. 5 indicator 1; fig. 2a indicator 21) while the photodetector continues to collect a second image signal, and the second switch then allowing transfer of the second image signal to the analog memory (fig. 5.)

10   Regarding claim 9, Dierickx teaches all the limitations of claim 9 (see the 102(b) rejection to claim 8 supra) including wherein the first image signal is collected during a first time period and the second image signal is collected during a second time period, the second time period being longer than the first time period (fig. 5.)

Regarding claim 10, Dierickx teaches all the limitations of claim 10 (see the

15   102(b) rejection to claim 9 supra) including wherein the second time period includes the first time period (fig. 5.)

Regarding claim 11, Dierickx teaches all the limitations of claim 11 (see the 102(b) rejection to claim 8 supra) including wherein a switch allows the photodetector and photodetector memory to be reset (fig. 5 indicator 2; fig. 2a indicator 22.)

20   Regarding claim 15, Dierickx teaches all the limitations of claim 15 (see the 102(b) rejection to claim 8 supra) including where the pixel is one in an array of similar pixels (col. 1 lines 18-22.)

Claims 1, 2, 3 and 5 are also rejected under 35 U.S.C. 102(e) as being

anticipated by Fukuda et al. (US #6,278,490.)

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Regarding claim 1, Fukuda teaches a method of exposure control comprising

collecting a short image signal during a first time period (fig. 6 labeled SHORT

EXPOSURE PERIOD; col. 10 lines 46-50), sampling the short image signal after the

first time period (fig. 6 labeled READ; col. 10 lines 46-50), collecting a long image signal

during a second time period (fig. 6 labeled LONG EXPOSURE PERIOD; col. 10 lines

50-56), sampling the long image signal after the second time period (fig. 6 labeled

READ; col. 10 lines 50-56), and combining the short image signal and the long image

signal to create a total image signal (fig. 5 indicator 8, col. 8 lines 40-42; col. 11 lines

10-15.)

Regarding claim 2, Fukuda teaches all the limitations of claim 2 (see the 102(e)

rejection to claim 1 supra), including wherein the second time period includes the first

time period (fig. 6.)

Regarding claim 3, Fukuda teaches all the limitations of claim 3 (see the 102(e)

rejection to claim 1 supra), including where the method further comprises resetting a

photodetector prior to collecting the short image signal (fig. 6 labeled V_{RS}; col. 10 lines

46-47.)

Regarding claim 5, Fukuda teaches all the limitations of claim 5 (see the 102(e)

rejection to claim 1 supra), including where the method further comprises simultaneous

sampling of the short image signal while collecting the long image signal (fig. 6; col. 10

lines 50-56.)

Claim Rejections - 35 USC § 103

5   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

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          Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Komiya

et al. (US #5,264,940) in view of Examiner's Official Notice.

15   Regarding claim 4, Komiya teaches all the limitations of claim 4 (see the 102(b)

rejection to claim 1 supra), except for explicitly teaching the method further comprises

resetting a memory containing the total image signal prior to collecting the short image

signal. Official Notice is taken regarding the resetting of memories associated with

image signals prior to the collection of image signals; a concept that is well known and

20   expected in the art. It would have been obvious to one of ordinary skill in the art at the

time of the invention to combine resetting a memory that contains an image signal with

the method taught by Komiya that includes a combined total image signal. One of

ordinary skill in the art at the time of the invention would have been motivated to reset a

memory containing the total image signal prior to collecting the short image signal in

25   order to record the next set of integrations starting at a zero value, therefore collecting

an image signal in a memory unaffected by previous integration values.

Claims 4 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Dierickx et al. (EP 0858212 A1) in view of Examiner's Official Notice.

Regarding claim 4, Dierickx teaches all the limitations of claim 4 (see the 102(b)

5   rejection to claim 1 supra), except for explicitly teaching the method further comprises

resetting a memory containing the total image signal prior to collecting the short image

signal.   Official Notice is taken regarding the resetting of memories associated with

image signals prior to the collection of image signals; a concept that is well known and

expected in the art. It would have been obvious to one of ordinary skill in the art at the

10   time of the invention to combine resetting a memory that contains an image signal with

the method taught by Dierickx that includes a combined total image signal. One of

ordinary skill in the art at the time of the invention would have been motivated to reset a

memory containing the total image signal prior to collecting the short image signal in

order to record the next set of integrations starting at a zero value, therefore collecting

15   an image signal in a memory unaffected by previous integration values.

Regarding claim 12, Dierickx teaches all the limitations of claim 12 (see the

102(b) rejection to claim 11 supra), except for teaching wherein a fourth switch allows

the analog memory to be reset.   Official Notice is taken regarding the implementation of

switches for the purpose of resetting analog memories; a concept that is well known and

20   expected in the art. It would have been obvious to one of ordinary skill in the art at the

time of the invention to add a switch, for the purpose of resetting the analog memory, to

the pixel as taught by Dierickx. One of ordinary skill in the art at the time of the

invention would have been motivated to add a reset switch in order to be able to clear

the analog memory prior to the next set of integrations, so that the analog memory

begins in a state that is free from the influence of previous integration values.

5   *Allowable Subject Matter*

Claims 13 and 14 are objected to as being dependent upon a rejected base

claim, but would be allowable if rewritten in independent form including all of the

limitations of the base claim and any intervening claims.

Regarding claim 13, the prior art is not found to teach or fairly suggest, in

10   combination with the claim 8 from which dependence is derived, wherein the analog

memory within an individual pixel combines the first image signal and the second image

signal to create a total image signal.

Regarding claim 14, the prior art is not found to teach or fairly suggest the

elements of claim 13, in combination with the claim 8 from which dependence is

15   derived. The Examiner does note that pixel readout sections are however well known

and expected in the art.

Conclusion

The prior art made of record and not relied upon is considered pertinent to

20   applicant's disclosure.

Shinozuka et al. (JP 2001145024 A) discloses a similar photodetector

configuration.

Horiuchi (US #6,801,248) discloses synthesizing images to achieve a wider

dynamic range.

Momose et al. (US #6,753,920) discloses a short exposure period followed by a

longer exposure period, after which both exposures are combined.

5   Trevino et al. (US #6,563,540) discloses a similar method of increasing the

dynamic range of a pixel.

Contact

Any inquiry concerning this communication or earlier communications from the

10   examiner should be directed to Gary C. Vieaux whose telephone number is 703-305-

9573. The examiner can normally be reached on Monday - Friday, 8:00am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Wendy Garber can be reached on (703) 305-4929. The fax phone number

for the organization where this application or proceeding is assigned is 703-872-9306.

15

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

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20   For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

Gary C. Vieaux
Examiner
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Gcv2

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TUAN HO
PRIMARY EXAMINER